

that in this age of boasted improvements such an absurd arrangement is allowed to be carried into practice, without a trial being made to improve it. Were the desideratum to obtain water impregnated with sooty particles, we could not use more efficient means. To place a cover on the tanks would, to a certain extent, obviate the difficulty, but the surface of the tank for receiving water would then be lost. The next and most satisfactory method would be the adoption of some simple means of filtering. But the expense of this would be at once objected to: nevertheless, it would be easy to show that the original expense would be soon repaid. It would be a very amusing, if not altogether useful, task to calculate the waste of money occasioned by the filthy state of rain water, especially in the towns of Manchester and Stockport alone. To purify in some measure the disgustingly filthy water obtained from the cisterns, especially after or during rainy weather, flour is sprinkled in it, which carries the contained impurities to the bottom. This is one item of loss; others might be mentioned. Rain water from the heavens is the purest we can obtain; it is then the wisest course to fit up receptacles, by which this may be collected and kept as pure and uncontaminated as possible for the many domestic purposes for which it is so well adapted. We believe that such a contrivance can be cheaply fitted up to every house, and that the important advantages derived therefrom would be beneficial in many points of view. People are, however, very apt to say, "Oh, the amount obtained yearly is of such small extent as not to be worthy of the expense of collecting." "Now, there is nothing," as brother Jonathan says, "like cyphering." Mr. Dempsey says, "the roof of a house of the average dimensions of 20 feet square, presenting a plane surface of 400 square feet, receives at least 800 cubic feet of rain water annually, or about 4,800 gallons." Now this quantity is equivalent to nearly 13½ gallons per day. We really wish every house in the kingdom had such a supply. But allowing only one half of this to be obtained, surely a sufficiently liberal estimate, it is certainly worth the collecting. The same writer says—"If well constructed and capacious gutters are provided, this quantity may be collected with little loss from evaporation, and will form a reserve stock for such special household purposes as it is specially adapted for. This quantity should be immediately received in a filtering tank, and the best available method be adopted of purifying it from the carbonaceous matter with which it becomes saturated in passing through a smoky atmosphere, and flowing over roof surfaces covered with a deposit of similar impurity. An economical and well-devised apparatus for effecting this purpose, and applicable to private and public buildings of all classes, is a desideratum yet wanting in the economical supply of water." As a slight contribution to the attempt to obtain such a valuable desideratum, we offer the following hints:—It must be an essential point in the construction of such a contrivance, that no lead shall be used in parts where the water is allowed to remain in, or even pass through. Slate is an admirable material, but it is heavy and cumbersome. Perhaps gutta percha would answer. A large cistern lined with this material will last a long time, will be cheap, and not in the slightest degree will it deteriorate the water. The pipes also by which the water is led to the interior of the house may also be made of this material. If the rain water is made to pass through filtering material made with coarse pounded charcoal and coarse gravel, it is "fitted for the use of the table, and from its solvent powers it makes tea admirably, with a saving of that commodity." A good filtering apparatus must be attached to the cistern. To allow of the water entering by the open surface of the tank or cistern, without exposing it to the following soot, a cover should be made, either of coarse canvas, wire gauze, or small perforated zinc plates. A wooden box should be made to fit loosely into the top part of the cistern, or it may lie on the outside edges; this box is provided with a perforated zinc bottom, a layer of coarse gravel is made to lie on this, in the inside of the box; above this, a layer of coarse pounded charcoal, then another layer of gravel similar to the first. A perforated zinc covering stretches across the

whole surface of the box; this not only prevents mechanical impurities from mixing with the water, but tends to diffuse the water (gushing from the pipe leading from the roof) over the surface: the water not gaining immediate admittance by the small holes beneath the pipe, is spread over the whole surface of zinc, and permeates through the body of the filtering material at all points. The filtering box, instead of being placed across the whole surface of the cistern, may be confined to one end only, but it will require to be made deeper; this, however, will not be of great consequence, as, if the whole water from the roof is made to pass through it, it matters not whether the lower portion of the filtering-box should dip into the water in the body of the cistern. If the box is confined to part of the surface only, a strainer cover should be stretched over the whole surface of the cistern. If the contrivance we have thus indicated should be objected to, on the score of expense, let the pipe from the large cistern communicate with the inside of a box provided with filtering material, this box hanging clear in the inside of an outer case, the filtered water being drawn off by a pipe below. This simple and efficient contrivance may be put in a corner of the scullery near the sink or slop stone; it may be made of zinc, to hold any requisite quantity of filtered water; the water from the cistern may be allowed to run slowly, yet continually, through a crane attached to the pipe leading from the cistern, so that the supply of filtered water may be kept up.

Rain-water may be retained for the purpose of flushing the drains, if not for domestic purposes. Mr. W. D. Guthrie was the first to propose a contrivance for this purpose. It consisted of a conical-shaped cistern, having, at its lower extremity, a valve opening into a pipe which led to the drain. A lever was fastened on one end of the cistern, and one end connected with the valve by a chain; by pulling down the end of the lever outside by a cord, the valve was lifted out of its seat, and the contained water in the cistern rushed down the pipe, effectually cleansing the drains. The surplus water of the cistern ran down by a pipe connected with the pipe leading to the drain, a little below the seat of the conical valve. This latter arrangement was defective, in so much as the gases of the drain had access to the atmosphere through the pipe. Mr. Hosmer's cistern could be adopted with advantage for such purposes. It "has a partition dividing it into two spaces, one considerably larger than the other, and containing the supply for domestic use, while the smaller space is intended to contain a reserve for cleansing the drains and sewers. A two-way cock is fitted in the cistern with ball and lever, and one aperture of the cock opens into each of the spaces in the cistern. The large division of the cistern is fitted with a pipe or pipes to deliver the house supply as required, and the small division has a syphon-trapped pipe leading into the drain and covered by a valve, the vertical rod of which is attached to the lever of the two-way delivery cock. The water from the main first fills the small division, the position of the lever being such that the valve at the lower part remains closed. The water then flows over the partition (which is kept a trifle lower than the sides of the cistern for this purpose) and fills the large division, the rising of the ball in which overcomes the pressure upon the valve in the small division, and lifts it suddenly to such a height as to permit of a rapid discharge of water through the syphon-trapped pipe into the drain." A modification of this plan, adapted to a filtering rain-water cistern would be advantageous in many respects. Such a cistern would be a valuable auxiliary to houses where the supply of water is maintained on the intermittent system. Not the least disadvantage of this defective plan of supplying houses with water, is the loss sustained by the water running over the cistern through the waste pipes; this is estimated in a certain district of London to be no less a quantity than 29 gallons per house, and this at each delivery. The supply of water to towns will never be on a proper footing till these wasteful appendages to cisterns shall be set aside, by the use of the system of constant supply at high service. One advantage to be derived from such a mode of supply, independently of the saving of material and time, will be the

ready means which every house may have within itself of extinguishing accidental fires. Nothing will be easier than to have recesses in the wall at the different landings of the staircase, and in passages, or in corners of the houses, having doors easily opened and combustible, in which may be coiled lengths of flexible hose, attached to a water crane, connected with a pipe led down the inside of the wall. Or small and very handsome cabinets may be placed in each apartment (fixtures of course), in which may be placed hose connected with a water-pipe: by opening the crane attached to these, a powerful stream of water may be directed to the burning mass wherever situated. These contrivances may be smiled at by some, as being Utopian in their character, mayhap stigmatised as trifling—nevertheless, if the term of threescore years and ten are to be allotted us, we shall certainly see these, or similar contrivances, adopted in every well-regulated house: unless, indeed, houses are hereafter, and that speedily too, constructed on such scientific principles as to render such preventive measures unnecessary.

WHAT IS "RESTORATION OF BUILDINGS?"

It is rebuilding the whole or part, or re-decorating and beautifying them. If then the church (or we will confine ourselves to churches), or any part of it, has already been destroyed, or is too ruinous to be used in safety, this is a necessary and laudable work. Or if the ornaments, carvings, or paintings are worn off, and are no longer beautiful, it is a very praiseworthy, though not so necessary a work. For our churches must be sound; they must not have even the appearance of neglect; and they must also be beautiful—as beautiful as we can make them.

In these cases, then, this work is good: and this being willingly granted, it may seem foolish to find fault with the name, but I am confident that this name does really mislead and cause incalculable injury. It must, therefore, be opposed.

Let it then be remembered, though it is of course a mere truism, that everything we make now, whether for ornament or use, whatever pattern or style, or design, it be of, is new. It may be correct or incorrect, beautiful or ugly, strong or weak—but it is new. It may have been put in the place of something old—it may even have been put over and upon the old—it may be an exact *fac-simile* of the old—or it may be put where no work of art ever was before; but in every case it is equally new. It is no matter whether it be a whole church or a chancel, or one pier or a capital, or even a single leaf or flower in it; if it is made now it is a new work. Why, then, call it a restoration? The name is false. There is nothing restored. Something original is taken away, or has decayed and fallen, and something new is inserted in its place. Restoration is the proper name for the operation. But no one would allow a church to be renovated. An outcry (and a most just and worthy one too) would be immediately raised against it. It is just what we are blaming our ancestors for. But under this specious name of restoration, clergymen, architects, and builders are permitted to knock to pieces, or scrape off the walls, carvings and paintings, which, strange to say, they themselves are all the while praising as of surpassing beauty. So far the process is exactly what the churchwardens of the last century might have done, the original decorations which have stood for centuries are irreparably lost, and the fragments thrown away. The next step may seem to be entirely different in the two cases, but it is not really. The space being cleared, the churchwardens (before mentioned) placed a kind of sign-painting, representing Moses and Aaron, or the King's arms, or else perhaps it was a great piece of stone-work, covered with cupids and inverted torches, and heathen deities, to the memory of the great man of the place. The restorer of to-day puts an elaborate piece of stone tracery, or creeping stems of foliage, or else a full-size picture of St. Christopher, carrying the infant Saviour, in which all the mistakes and some of the beauties of the old picture are copied with wonderful accuracy. In both cases, the new work is supposed to be "more beautiful, or in

* To be continued.